A4

1. $\pi_{Fname, Lname}$ (COMPETITOR)

2 $\pi_{Fname, Lname}$ ($\sigma_{Age<12}$ ($\sigma_{Instrument='oboe'}$ (COMPETITOR))

3 $\pi_{competitorID, StudioName}$ (COMPETITOR $\bowtie_{TeacherID = TeacherID}$ TEACHER)

4 $\pi_{Fname, Score}$ ← (COMPETITOR $\bowtie_{CompetitorID = CompetitorID}$ PERFORMANCE)

5 COMP_PERF ← (COMPOSITION $\bowtie_{MusicID = MusicID}$ PERFORMANCE)
COMP_PERF_CAT ← (COMP_PERF $\bowtie_{categoryID = categoryID}$ CATEGORY)

π ($\sigma_{compTime='12:00:00'}$ (COMP_PERF_CAT))

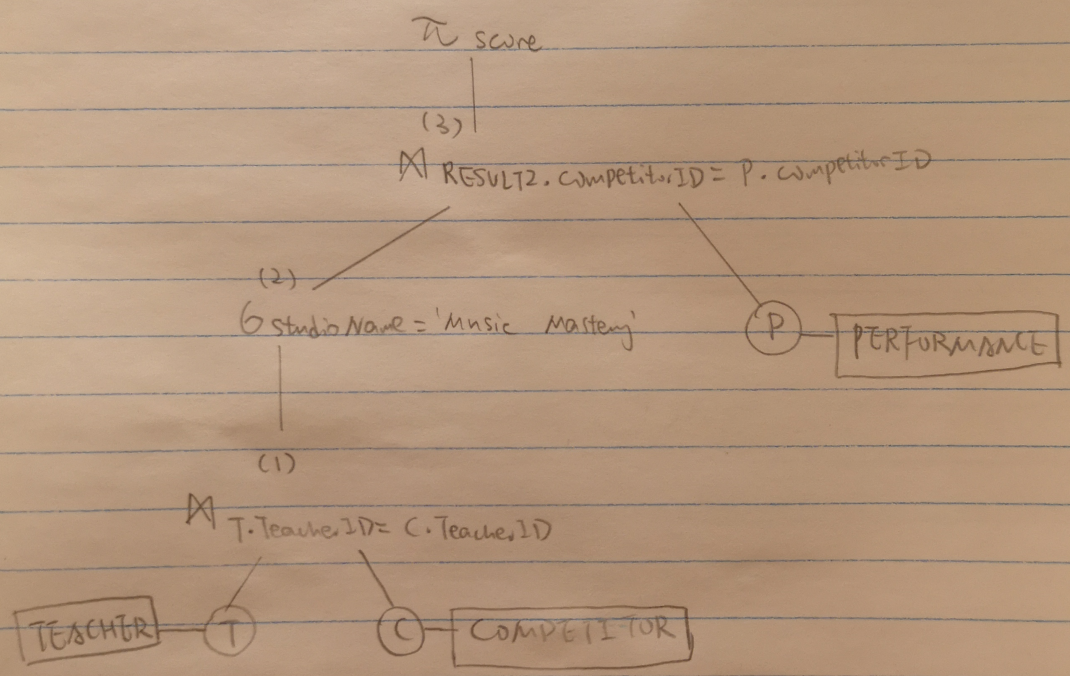
6 RESULT1 = $\pi_{MusicID}$ (COMPOSITION)
RESULT2 = $\pi_{MusicID}$ (PERFORMANCE)
RESULT3 = RESULT1 − RESULT2
RESULT4 = RESULT3 $\bowtie_{MusicID = MusicID}$ COMPOSITION
π_{Title} (RESULT4)

Q7

7. $RESULT1 \leftarrow TEACHER \bowtie_{TeacherID = TeacherID} COMPETITOR$

$RESULT2 \leftarrow \sigma_{StudioName = 'Music\ Mastery'}(RESULT1)$

$\pi_{score}(RESULT2 \bowtie_{competitorID = competitorID} PERFORMANCE)$.



Q8

Four informal guidelines for a good relation schema design:

-Making sure that the semantics of the attributes is clear in the schema

-Reducing the redundant information in tuples

-Reducing the NULL values in tuples

-Disallowing the possibility of generating spurious tuples